Vermont Farm Methane Program Quarterly Report

Prepared by: Jeffrey W. Forward and Dan Scruton **January 13, 2003**

Introduction:

The Vermont Department of Public Service (DPS) and the Vermont Department of Agriculture (AGR) have received a total of $695,000 from appropriations from the federal budget over the past several years to promote the use of methane recovery technology on Vermont dairy farms. This technology has the potential to help farmers with their nutrient management plans and at the same time provide additional on-farm income. The goal of this program is to identify and help overcome key strategic hurdles to widespread adoption of methane recovery technologies by Vermont farmers.

The program was designed to consider methane recovery in a broad context, taking into account its potential benefits as a component of a comprehensive nutrient management system, as a renewable energy source and as a strategy for greenhouse gas reduction. The implementation plan calls for using one third of the money for program administration and outreach, one third toward research and development and one third to be used for cost share of installations.

PROGRAM SUMMARY-TO-DATE AND PROGRAM ACTIVITIES Oct. 1 – Dec. 31, 2002

ORGANIZATIONAL:

Biomass Energy Resource Center, Inc.

The Vermont Methane Program established a part time staff position at the Biomass Energy Resource Center (BERC) that will be specifically devoted to this program. BERC is a not-for-profit private corporation with the mission of promoting and developing biomass energy projects. This is a project oriented organization that hopes to work on biomass projects in Vermont, the Northeast and globally. Vermont has considerable experience in small and medium scale biomass projects and the goal of this organization is to export that expertise by facilitating specific projects.

Program Advisory Committee:

We do not have a Program Advisory Committee scheduled at this time. We are in the process of re-evaluating our outreach strategy and will adjust it based on the new reality since the group net metering law passed. Once we have worked out a proposed strategy, we will convene a program advisory committee to solicit their input.

Program Executive Committee:

We do not have an Executive Committee scheduled at this time, but do plan on meeting in early 2003. At that

time we will discuss the Vermont Methane Program goals and objectives and better define each partner's role in the program.

POLICY INITIATIVES:

Group Net Metering

The Vermont legislature debated the fate of S. 264, a renewable energy bill, up until the very last days of the 2002 legislative session. Ultimately the bill did not pass. However, the section of the bill that dealt with group net metering for farm based systems was attached to another bill, S. 138 and that bill did pass.

Group net metering as defined by this bill is a concept whereby a farmer could group a number of electric accounts that are somehow connected to the farm and use the amount of energy produced through a renewable energy system based on the farm to offset the collective electric bills of that group. This concept would essentially allow a farmer to receive a retail rate for much of the energy produced by a methane recovery system.

The Public Service Board is currently in the process of drafting rules relating to group net metering. The Vermont Methane Program will monitor the progress of this process and has offered to help the PSB and the administration understand the intent of this new law. The VMP will also re-evaluate its outreach strategy to consider what kind of technical support it should be providing Vermont dairy farmers in light of this new policy. The net metering law should go a long ways toward solving many of the return on investment issues for many farmers.

Emissions Trading and "Green Tags":

Green Tags is a notion where the environmental benefits of a particular generation source are marketed to consumers for a premium. In this case, farm based methane might offset conventional generation sources along with their associated environmental impacts as well as reduce the amount of methane released in the atmosphere. Since naturally occurring methane is a significant greenhouse gas, using that gas could have a significant environmental benefit. Native Energy, Inc. is a company that markets green tags throughout the US. They have expressed interest in negotiating contracts to purchase these credits from farms and sell these environmental benefits to consumers through these "Green Tags".

Some Vermont utilities have also expressed an interest in purchasing the renewable energy credits from farm methane projects. This concept is very similar to the Green Tags. A farm could only sell the environmental attributes once either as credits or as tags. The Vermont Methane Program is continuing to explore the risks and benefits of such strategies from the producer's perspective.

US Farm Bill

Several sections of the US Farm Bill could significantly impact the market for anaerobic digestion on Vermont dairy farms. For example, Section 9006 of Title IX is the Energy Title of the bill and deals specifically with

renewable energy and energy efficiency on farms. This section will provide $ 23 million of funding annually to American farmers to help them install energy efficiency measures and renewable energy systems. Dan and Jeff both had discussions with USDA Rural Development office in Vermont, and in December, Jeff traveled to Washington DC to provide testimony relative to anaerobic digestion to the USDA who is drafting rules for implementing Section 9006. The Vermont Department of Agriculture, Food and Markets and the Public Service Department also provided written testimony to the Committee.

Section 2301 of Title II provides increased funding for the Environmental Quality Incentive Program (EQIP) which helps farmers implement nutrient management plans. This section has $700 million dollars appropriated for the next fiscal year and $1.3 billion for the year after. The Environmental Defense Fund (EDF) is a non-profit environmental organization that is providing input to the USDA as they draft the rules for EQIP. At their request, Jeff Forward met with EDF staff in Washington to discuss the mechanics of methane recovery and how it might fit with other nutrient management strategies. Subsequently, Jeff, Dan and Phil Benedict, held a conference call with them. The VMP will continue to advise USDA Rural Development here in Vermont and others on how these monies might be best used to help Vermont farmers with the up front capital costs of anaerobic digestion.

Attached are copies of testimony submitted by partners of the VMP.

RESEARCH AND DEVELOPMENT

Foster Bros. Dairy Farm research and demonstration site:

Foster Bros. have a two chambered side-by-side digester that they have been using successfully for over 15 years. The VMP has isolated these chambers into two separate digesters so that we can experiment with various materials and technologies and still maintain a control that we know works.

As a result of a series of unrelated mishaps the Fosters digester has been only operating intermittently over the past two years. This quarter the Fosters were able to get the generator fixed and the system operating again. Dan currently has power monitoring equipment logging the power output of the system. We are currently doing some basic energy balance work to see how the rebuilt generator is performing, how much diesel fuel it is usage, what is the maximum percentage of gas use, etc. We will begin to tabulate this data for future reference.

INQUIRY FOLLOW-UPS:

This quarter Dan Scruton has been continuing to work with the following specific farms and groups:

Addison County digester/composted bedding system dairy:

Dan has been working with Stan Weeks and CVPS on finishing the designs and finalizing the cost estimates for a farm in Addison County. The current design is a net metering arrangement that will provide power to

all of the farm buildings and housing associated with the farm. This will probably be the first farm net metering system to go before the Public Service Board so we are trying to make sure we have it right. Dave Dunn is the lead engineer for CVPS on this project. Dave has worked closely with this farm in the past on many energy efficiency improvements so we have a utility person who is familiar with the project and farm energy needs working with us.

Most of the schematic for the digester is worked out and we are now working on site location and sizes for the specific tanks and equipment. The biggest design task left is the composting system to make bedding from the manure solids. Then we will be able to give the farm firm numbers and they can make a final go/no-go decision.

Franklin County whole manure system:

Dan met with the Vermont Public Power Supply Authority (VPPSA) about a proposal they made to a Franklin County farmer. As a result of this meeting they are making changes to their proposal and will get back to the farmer soon. We also have worked up some cost/benefit numbers for a variety of other options that are being considered.

Dan is meeting with the farmer and VPPSA in January 2003. The hope is to have a system that would be built this summer. One interesting possibility on this system is that VPPSA may operate all or part of the system and generate renewable credits for use in the Massachusetts Renewable Portfolio Standard program.

Orleans County farmstead cheese operation:

We have been looking at options for a farmer considering a small cheese making operation to see if a system would be practical to provide energy for the cheese making operation and odor control as well. We should be finishing the analysis during the first quarter of 2003.

Orange County farm with sand bedding:

USDA will likely have EQIP grant money available in 2003 to cover some of the capitol costs of systems. We were originally going to wait and fund part of the construction cost but we are now considering providing money to perform a more detailed feasibility study on this farm than the one we performed previously. We will continue to work with this farmer this winter with the hope of having a completed system design this winter so that the farmer will be ready to apply to USDA for construction cost assistance in the spring.

Chittenden County whole manure digester:

The farm still has not finalized barn plans but is still interested in working with us when they build. They will let us know when they are ready for site-specific designs.

Cooperative system possibility:

Northern Vermont Economic Development and USDA Rural Development in Franklin County talked to Jeff and Dan about the possibility of a cooperative manure/energy system in the St. Albans Bay region of the state. Dan has been considering a similar proposal and has now combined efforts, working with them on developing the idea. Letters went out to the farmers and local Select boards for St. Albans Town and Swanton about the possibility. Discussions were also held with the Department of Buildings and General Services and Department of Corrections. All groups have given a positive response and we will be proceeding with the looking at the feasibility of the project.

Essex Waste Water Treatment Facility

The primary focus of the VMP is to promote methane recovery on Vermont dairy farms. However, other efforts in the state to use methane as a fuel will certainly have impacts on this emerging market. One such project is the Essex Waste Water Treatment Facility (EWWTF). The Village of Essex recently committed to installing two micro-turbines at this facility that will operate on biogas produced in anaerobic digesters that are already part of the sewage treatment process. The Biomass Energy Resource Center is a contributing partner in this project along with Efficiency Vermont, the state's Efficiency Utility and Northern Power Systems a Vermont based company specializing in renewable energy installations. The VMP will work with the EWWTF plant operator to establish a control and data collection protocol that will hopefully raise the level of knowledge in Vermont about the use of methane as a fuel for electrical generation.

OUTREACH:

Tours:

One of the great benefits of setting up our research program at Foster Brothers Farm in Middlebury is that it is an excellent demonstration site. The Fosters have nearly 20 years of experience with this technology and related systems and they are very excited about some of the experiments we are performing there. Tours of the Foster Bros. facility allow us to display some of our experimental technologies and it gives us a good opportunity to discuss with other individuals, groups and organizations possibilities for collaboration.

No tours were conducted this past quarter, but we did have at least two inquiries. One inquiry was from an engineer in New Hampshire who is interested in experimenting with designs that could be used on small farms. The other inquiry was from a woman who helps manage a 5,000 head dairy farm in the Ukraine. She is particularly interested in understanding how a farm that uses sand bedding might incorporate anaerobic digestion into their nutrient management plan. She hopes to be back in Vermont in early 2003 and would like to bring other folks from this Ukrainian farm to see Foster Bros. and to discuss any ideas or insights we might have into the sand bedding issue.

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Attachments:

- Biomass Energy Resource Center oral and written testimony for USDA hearing on the US Farm Bill
- DPS written testimony on US Farm Bill
- AGR written testimony on US Farm Bill